

Health effects of coal dust



Of all the air pollutants produced by coal mining activities, particulate matter is the most significant health threat. Most health and medical research on particulates has focused on fine particles known as PM_{2.5} (measuring up to 2.5 micrometres in diameter) and PM₁₀ (up to than ten micrometres in diameter) as these are associated with the most significant health impacts. Fine particles are generally the result of combustion processes such as motor vehicles and power stations. Coarse particles are produced by mechanical processes including coal mining and transport.

As a major component of outdoor air pollution, particulates can trigger heart attacks and strokes. Particulate matter has been deemed carcinogenic by the World Health Organisation. Fine particles travel deep into the lungs and pass into the blood stream, posing a risk of stroke and heart attacks.

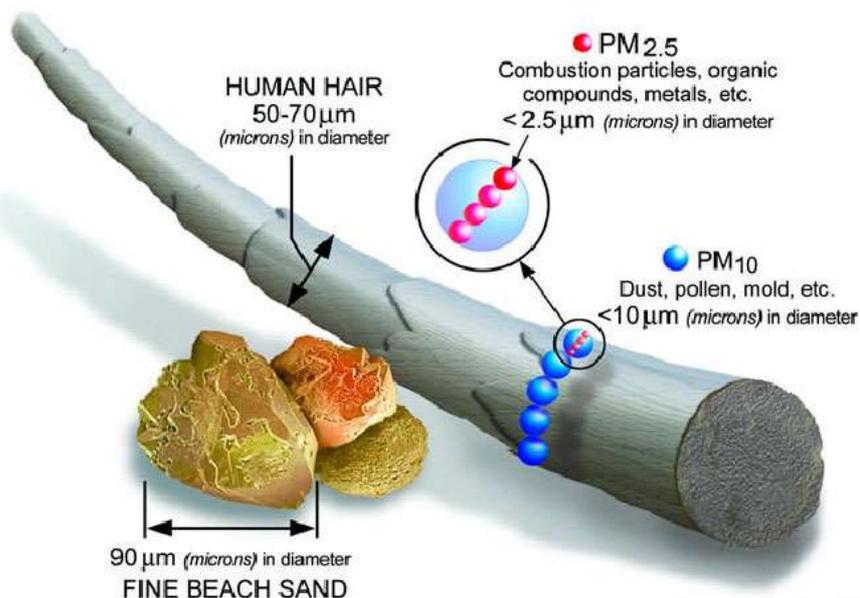


Image courtesy of the U.S. EPA

There is no threshold below which particle pollution exposure is not harmful to health (World Health Organisation). So although environmental regulators in Australia tend to consider particle concentrations up to the national standard 'acceptable' or even 'good', community health is improved by reducing particle pollution right down to zero. Health impacts are associated with both short-term and long-term exposure.

New national standards for particle pollution were adopted by Australia's nine environment ministers on 15 December 2015. Stricter standards were recommended (NEPC 2014; EJA 2015) and supported by Victoria and the Australian Capital Territory.

	PM _{2.5} 24 hour average	PM _{2.5} annual average	PM ₁₀ 24 hour average	PM ₁₀ annual average
Standards proposed in the 2014 Impact Statement	15, 20 or 25µg/m ³	6, 8 or 10µg/m ³	30, 40 or 50µg/m ³	12, 16 or 20µg/m ³
Agreed at Minister's Meeting of 15 December 2015	25µg/m ³	8µg/m ³	50µg/m ³	25µg/m ³

The new standards are regularly exceeded in the Hunter Valley and may also be in Central Queensland and other coal-affected regions where there is presently no air pollution monitoring or data is not readily available.

Impacts in coal-affected communities

Coal mining accounts for almost half (47%) of Australia's reported PM₁₀ emissions (NPI). These emissions have more than doubled in the last five years from 210,000 tonnes in 2008-09 to 435,000 tonnes in 2013-14. Most of the 50 open-cut coal mines that dominate these emissions are located in the coalfields of Central Queensland and the Hunter Valley in New South Wales.

Despite the Hunter region having higher than average rates of respiratory and cardiovascular disease including asthma, there has been minimal research into the health impacts of mining-

\$600 million	Health costs of pollution from the five coal fired power station in the Hunter Valley
\$47 million	Health damages for the towns of Singleton and Muswellbrook
\$18.3 million	Exposure of Muswellbrook residents to fine particles (PM _{2.5}) emitted from coal mines and coal fired power stations
\$18 million	Health costs associated with air pollution (PM ₁₀) from coal sources in Newcastle

Table. Estimated annual health costs associated with particle pollution in the Hunter Valley Source: CAHA 2015

Exposure pathways

- Removal of overburden
- Blast plumes
- Wind erosion of overburden
- Unpaved roads in and around mines
- Uncovered coal stockpiles
- Draglines and other excavators
- Loading and unloading trucks, trains and ships including uncovered coal wagons
- Conveyors

References

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<https://www.environment.gov.au/protection/nepc/nepms/ambient-air-quality/variation-2014/impact-statement>
- National Pollutant Inventory <http://www.npi.gov.au>
- World Health Organisation (2015 'Ambient (outdoor) air quality and health'
<http://www.who.int/mediacentre/factsheets/fs313/en/>